

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently amended) Pump device for the hydraulic actuation of a valve for a pipeline or a tree used in the production of crude oil or natural gas, the pump device comprising:

a piston-cylinder unit having a piston within a cylinder, the cylinder having a first port in fluid communication with the valve and a second ports, the piston travelling to a first position forcing hydraulic fluid in the cylinder out the first port ~~in the direction of~~ to the valve under pressure and travelling to a second position drawing hydraulic fluid through the second port and into the cylinder; and

an electrical drive movably connected to the piston of the piston-cylinder unit for the alternating movement of the piston in a piston longitudinal direction inside the cylinder.

2. (Previously presented) Pump device according to claim 1, wherein the electrical drive includes a spindle drive, a reduction gear, a spur gear and at least one drive shaft with at least one electric motor rotating the drive shaft.

3. (Previously presented) Pump device according to claim 2, wherein the spindle drive includes a rotatable, but axially immovable threaded spindle nut threadingly engaging an axially movable threaded spindle.

4. (Previously presented) Pump device according to claim 3, wherein the threaded spindle is a threaded shaft releasably connected at its actuating end to the piston.

5. (Previously presented) Pump device according to claim 3, wherein the spindle nut is movably connected to the reduction gear.

6. (Previously presented) Pump device according to claim 3, wherein the spindle nut is rotationally rigidly connected to a flexible, cup-shaped toothed sleeve of a harmonic drive gear.

7. (Canceled)

8. (Previously presented) Pump device according to claim 6, wherein the spur gear is a helically toothed spur gear having a first spur wheel and a second spur wheel, the second spur wheel being rotationally rigidly arranged on the drive shaft driven by the motor and a wave generator of the harmonic drive gear being rotationally rigidly connected to the first spur wheel.

9. (Previously presented) Pump device according to claim 2, wherein the spur gear is a double helical gear.

10. (Previously presented) Pump device according to claim 1, wherein the piston is adjustably supported in a piston chamber of the cylinder in the piston longitudinal direction, whereby the first and second ports are disposed on a face side of the piston chamber and include at least one suction and one discharge hole, the suction hole opening into an intermediate reservoir of the pump device.

11. (Previously presented) Pump device according to claim 10, wherein a non-return valve is disposed in each hole extending through a valve member and into a cylinder bottom plate, the non-return valves being subjected to a force opposite to the hydraulic fluid flow direction through the respective hole.

12. (Previously presented) Pump device according to claim 10, wherein the holes are formed in a cylinder bottom plate releasably fixed on the cylinder, the cylindrical bottom plate including a branch connected to a pressure switch.

13. (Previously presented) Pump device according to claim 10, wherein the suction hole opens into the intermediate reservoir of the pump device with its end facing away from the piston.

14. (Canceled)

15. (Currently amended) Pump device according to claim 10, wherein the discharge hole is connected to a discharge pipe for the passage of the hydraulic fluid ~~in the direction of~~ to the valve.

16. (Previously presented) Pump device according to claim 10, wherein the discharge pipe is brought out through an intermediate reservoir from a pump housing.

17.-32. (Canceled)

33. (Currently amended) Pump device according to claim 1, wherein the pump device is of modular construction and includes a pressure relief valve communicating with the inlet port.

34. (Canceled)

35. (Previously presented) Pump device according to claim 16, wherein a quick-release coupling device is arranged between the pump housing and a hydraulic fluid supply pipe.

36. (Previously presented) Pump device according to claim 1, wherein at least two servomotors are arranged redundantly with respect to one another.

37. (Previously presented) Pump device according to claim 1, wherein the hydraulic fluid is an injection fluid.

38. (Previously presented) Pump device according to claim 3, wherein a position sensor determines the position of at least the threaded spindle.

39. (Previously presented) Pump device according to claim 5, wherein the reduction gear is a harmonic drive gear.

40.-41. (Canceled)

42. (Previously presented) Pump device according to claim 37, wherein the injection fluid is an inhibitor.

43. (Currently amended) Pump device for the hydraulic actuation of a safety valve on a pipeline or tree used in the production of hydrocarbons, the pump device comprising:

a body with a cylinder housing a piston such that hydraulic fluid can be pumped under pressure ~~in the cylinder in the direction of~~ to the safety valve;

a sensor for sensing the hydraulic fluid pressure;

a pressure switch receiving signals from the sensor;

an electrical drive device movably connected to the piston of the piston-cylinder unit to move the piston in a longitudinal direction inside the cylinder upon the hydrocarbons reaching a predetermined pressure in the pipeline or tree; and

the pressure switch activating a relief valve to relieve the pressure in the cylinder upon the pressure in the cylinder reaching a predetermined value in the cylinder.

44. (Currently amended) An apparatus for supplying pressurized hydraulic fluid to actuate a valve on a subsea tree used in the production of hydrocarbons, the apparatus comprising:

a piston-cylinder unit having a piston within a cylinder to force hydraulic fluid from the cylinder under pressure ~~into-through~~ a conduit to the subsea tree valve for hydraulic actuation of the subsea tree valve; and

an electrical drive movably connected to the piston to drive the piston within the cylinder to pressurize the hydraulic fluid.

45. (Previously presented) The apparatus of claim 44 further including a hydraulic source located subsea and the cylinder of the piston-cylinder unit communicating with the hydraulic source to pump the hydraulic fluid.

46. (Previously presented) The pump apparatus of claim 44 wherein the piston-cylinder unit and electrical drive device are adapted for releasable connection to the body of the subsea tree.

47. (Currently amended) A pump device for the hydraulic actuation of a safety valve on a pipeline or tree used in the production of hydrocarbons, the pump device comprising:

a body with a cylinder housing a piston such that hydraulic fluid can be pumped under pressure from the cylinder ~~in the direction of~~ to the safety valve; and

an electrical drive device movably connected to gears for rotating an axially immovable threaded spindle nut threadingly engaging an axially movable threaded spindle connected to the piston of the piston-cylinder unit to move the piston in a longitudinal direction inside the cylinder as the threaded spindle nut threads onto the threaded spindle.